

Remarks

Claims 1-11 were pending and subject to a restriction requirement. Applicants affirm their election to prosecute the claims directed Groups I and III (claims 1-6 and 8-11). Applicants herein cancel claims 1, 5, 6 and 7 to focus on the method of use claims originally defined in Group III. Claims 2-4 and 8-23 are pending.

Claims 2, 3 and 4 have been changed from compound claims to process claims depending from claim 8. Claim 8 has been rewritten as a process for the manufacture of optical recording medium having at least one recording layer comprising the steps of a) incorporating a metallocenyl compound of claim 1 into said recording layer. Claims 9 and 10 define optical recording medium that incorporate the subject matter of claim 1 expressly, rather than by reference. Claim 11 has been rewritten to depend from claim 8 that defines the optical recording medium. New claims 12 and 14 are drafted analogously to claim 8 but incorporating a mixture of claims 5 and 6. New claims 13 and 15 are drafted analogously to claim 11 though depending from claims 12 and 14, respectively. New claims 16, 17, 19, 20, 21 and 22 are based on original claims 2, 3 and 4. New claims 18 and 23 are based on original claim 11. No new matter has been added.

The Examiner rejects claims 1-6 and 8-11 under 35 U.S.C. 112(2) as being indefinite for failing to particularly point out and distinctly claim the intended subject matter. The Examiner objects, with respect to claim 1, the phrase "atoms or atom groups" and requests changing to "members". Claim 1 has been canceled. However, to the extent the subject matter of claim 1 has been used in related claims, the Examiner's suggestion has been adopted.

The Examiner objects to claims 8 and 11 for defining processes without any steps. Claims 8 and 11 have been rewritten using a conventional process claim format.

The Examiner rejects claims 1, 2, 8, 9 and 11 under 35 U.S.C. 102(b) as being anticipated by an article by Cook from the Journal of Chemical Society ("Cook"). The Examiner notes that the process claims would be free of the reference if they contained actual steps. In view of the above amendments, Applicants submit that the instant rejection is moot and/or overcome.

The Examiner rejects claims 1, 2, and 8-11 under 35 U.S.C. 103 as being unpatentable over Cook in view of published EP 811,506 ("EP '506") and U.S. Pat. No. 5,124,067 ("Itoh et al"). The Examiner asserts that Cook discloses a simple coated on a glass slide having a metallocenyl phthalocyanine dye. The Examiner then asserts that it would be reasonable to use the metallocenyl phthalocyanine dye shown in Cook in place of the metallocenyl phthalocyanine dye used in EP '506. The Examiner asserts that Itoh teaches that liquid crystal materials and optical recording media are technically linked. Applicants respectfully traverse this rejection.

Cook is directed to liquid crystal displays. Cook does not describe or suggest the use of phthalocyanines as claimed for use in optical recording mediums. The Examiner indicates that Itoh provides sufficient motivation or guidance for one skilled in the art to believe dyes suitable for use in liquid crystal materials would perform analogously in optical recording media. Of course, this teaching is limited by the fact that Itoh does not disclose the inter-media comparability of metallocenyl-substituted dye compounds. Itoh emphasizes that "when the near infra-red absorber of the present invention is used as a display material together with liquid crystals, the absorber must be highly soluble in the liquid crystal." Therefore, it cannot be alleged that Itoh teaches that all phthalocyanine compounds would be expected to be suitable for use in both applications.

Furthermore, this alleged guidance must be taken in light of the teachings in EP '506 that the metallocenyl group has no advantage relative to other groups mentioned in formulae (2) to (5). EP '506 suggests that the essential attribute is a substituent connection to the main ring system through a sulfonic acid group. Cook does not employ such a linking group. Consequently, those skilled in the art would not have been motivated to use the dyes having a ferrocenyl group without a sulfonic acid linking group for making optical recording media as taught in EP '506. The claimed compositions herein do not include such a sulfonic acid group linking group. Therefore, even if the references could be combined in the manner suggested by the Examiner, the result does not disclose the claimed invention. Applicants request that the Examiner reconsider and withdraw his obviousness rejection of the pending claims in light of Cook, Itoh and EP '806.

The Examiner rejects claims 1-6 and 8-11 under the judicially created doctrine of obviousness-type double patenting over claims 1-5 of U.S. Pat. No. 6,399,768. The claims have been rewritten in a

process claim format that differs substantially from the compound and mixture claims allowed in the '768 Patent. Applicants request that the Examiner reconsider this rejection in light of the above-amendments.

Applicants submit that the present application is now in condition for allowance. In the event that minor amendments will further prosecution, Applicants request that the Examiner contact the undersigned representative.

Respectfully submitted,



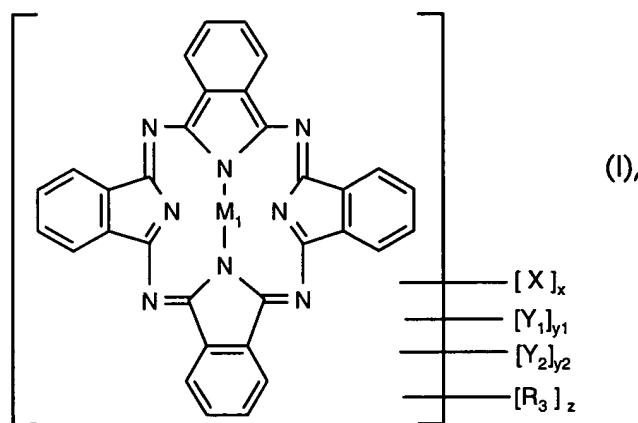
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Amended Claims with underlining and bracketing

2. (amended) A process according to claim 8 wherein the metallocenyl-phthalocyanine compound is represented by metallocenyl-phthalocyanine of formula I



wherein

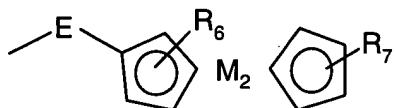
M₁ is a divalent metal, an oxometal group, halogenometal group or hydroxymetal group, or two hydrogen atoms,

X is halogen

Y₁ is -OR₁, -OOC-R₂, -NHR₁, -N(R₁)R₂,

Y₂ is -SR₁,

R₃ is



R₆ and R₇ are each independently of the other hydrogen, halogen, C₁-C₄alkyl, C₁-C₄alkoxy, amino-C₁-C₄alkyl, diarylphosphine, or phosphorus-containing C₁-C₄alkyl,

x may be a rational number from 0 to 8

y₁ and y₂ may be each independently of the other a rational number from 0 to 6

z may be a number from 1 to 4,

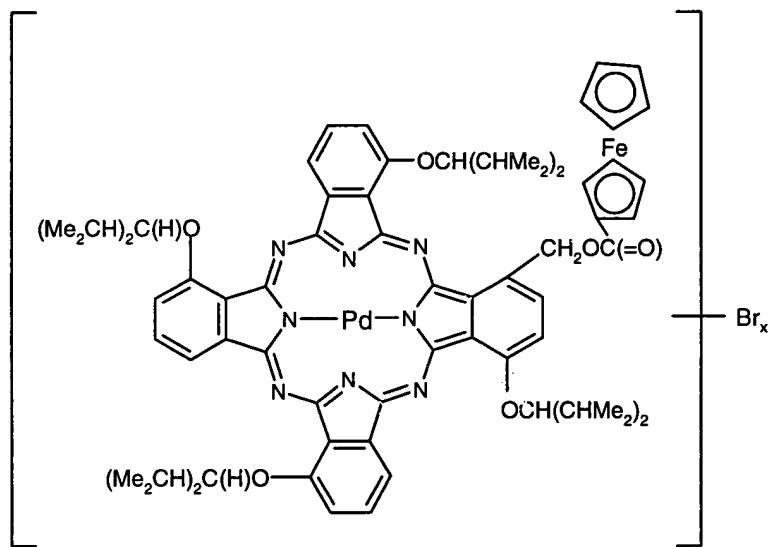
wherein (x + y₁ + y₂ + z) is ≤ 16,

and wherein R₁ and R₂ may be each independently of the other

C₁-C₂₀alkyl which is unsubstituted or substituted by halogen, hydroxy, C₁-C₂₀alkoxy, C₁-C₂₀alkylamino or C₂-C₂₀dialkylamino and which may be interrupted by -O-, -S-, -NH- or -NR₁₀-, wherein R₁₀ may be C₁-C₆alkyl,

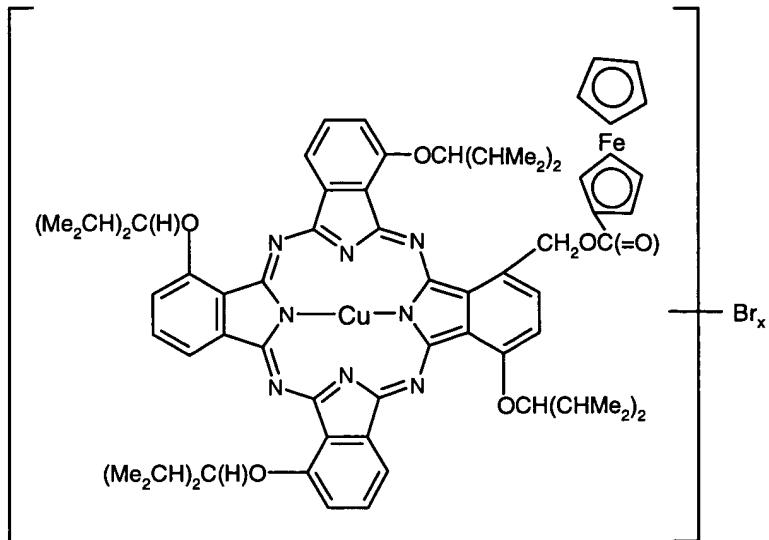
C₅-C₂₀cycloalkyl, C₂-C₂₀alkenyl, C₅-C₁₂cycloalkenyl, C₂-C₂₀alkynyl, C₆-C₁₈aryl or C₇-C₁₈aralkyl, and wherein one or two ligands may optionally be bound to the divalent metal atom, the oxometal group, halogenometal group or hydroxymetal group, and E is being composed of a chain of at least two members selected from the group consisting of -CH₂-, -C(=O)-, -CH(C₁-C₄alkyl)-, -C(C₁-C₄alkyl)₂-, -NH-, -S-, -O- and -CH=CH- as defined in claim 1.

3. (amended) A process according to claim 8 wherein the metallocenyl-phthalocyanine compound is represented by metallocenyl-phthalocyanine of formula



where x = 2.6 to 3.0, preferably 2.7 to 2.9, more preferably 2.8 .

4. (amended) A process according to claim 8 wherein the metallocenyl-phthalocyanine compound is represented by metallocenyl-phthalocyanine of formula



where $x = 0$ to 0.5

8. (amended) Method of using the compound according to claim 1 in a manner known per se for the production of an optical recording medium. A process for the manufacture of optical recording medium having at least one recording layer comprising the steps of

a) incorporating a metallocenyl-phthalocyanine or its metal complex of a divalent metal, oxometal, halogenometal or hydroxymetal, in which at least one of the four phenyl rings of the phthalocyanines contains, bound via a bridge unit E, at least one metallocene radical as substituent, E being composed of a chain of at least two members selected from the group consisting of $-CH_2-$, $-C(=O)-$, $-CH(C_1-C_4\text{alkyl})-$, $-C(C_1-C_4\text{alkyl})_2-$, $-NH-$, $-S-$, $-O-$ and $-CH=CH-$ into said recording layer.

9. (amended) An optical recording medium, which comprises a metallocenyl-phthalocyanine or its metal complex of a divalent metal, oxometal, halogenometal or hydroxymetal, in which at least one of the four phenyl rings of the phthalocyanines contains, bound via a bridge unit E, at least one metallocene radical as substituent, E being composed of a chain of at least two members selected from the group consisting of $-CH_2-$, $-C(=O)-$, $-CH(C_1-C_4\text{alkyl})-$, $-C(C_1-C_4\text{alkyl})_2-$, $-NH-$, $-S-$, $-O-$ and $-CH=CH-$ according to claim 1.

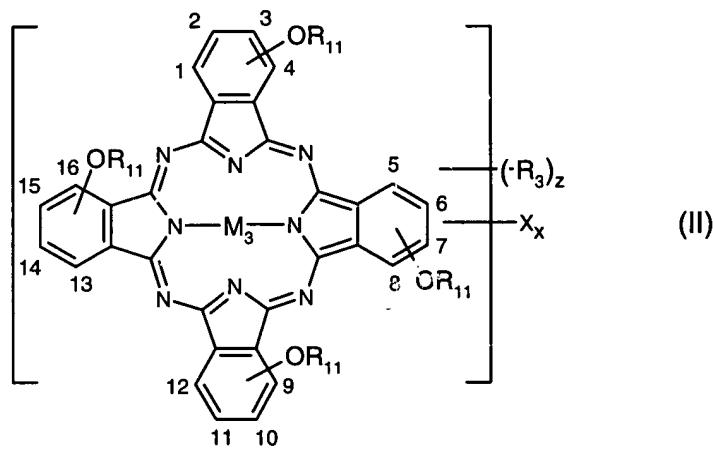
10. (amended) An optical recording medium according to claim 9, which consists essentially of a transparent substrate, a recording layer on that substrate, a reflection layer on the recording layer and, if desired, a final protective layer, the recording layer comprising the a metallocenyl-phthalocyanine or its metal complex of a divalent metal, oxometal, halogenometal or hydroxymetal, in which at least one of the four phenyl rings of the phthalocyanines contains, bound via a bridge unit E, at least one metallocene radical as substituent, E being composed of a chain of at least two members selected from the group consisting of -CH₂-, -C(=O)-, -CH(C₁-C₄alkyl)-, -C(C₁-C₄alkyl)₂-, -NH-, -S-, -O- and -CH=CH-according to claim 1.

11. (amended) A process according to claim 8 wherein the optical recording medium is a DVD, a diffractive-optical element or medium for recording a hologram. Method of using the optical recording medium according to claim 9 for the optical recording, storage and reproduction of information, for the production of diffractive optical elements or for the recording of holograms in a manner known per se.

12. (new) A process for the manufacture of optical recording medium having at least one recording layer comprising the steps of

a) incorporating mixture, which comprises

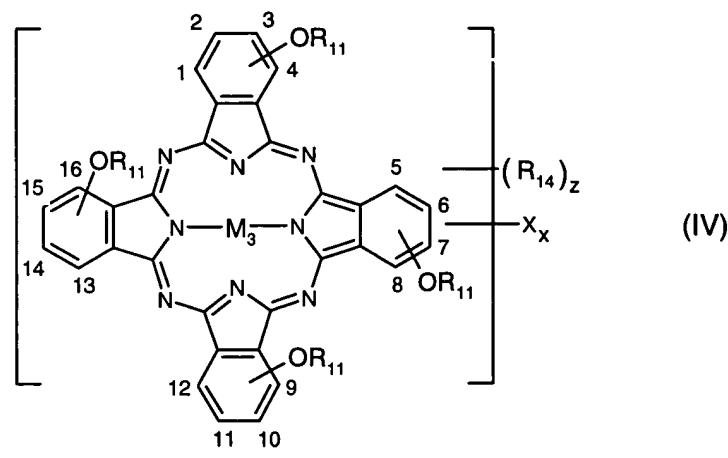
(a) 60 to 95 mol % of a compound II



containing one radical R₃ (z = 1),

(b) 5 to 20 mol % of a compound II containing two radicals R₃ (z = 2),
and

(c) 0 to 25 mol % of a compound IV



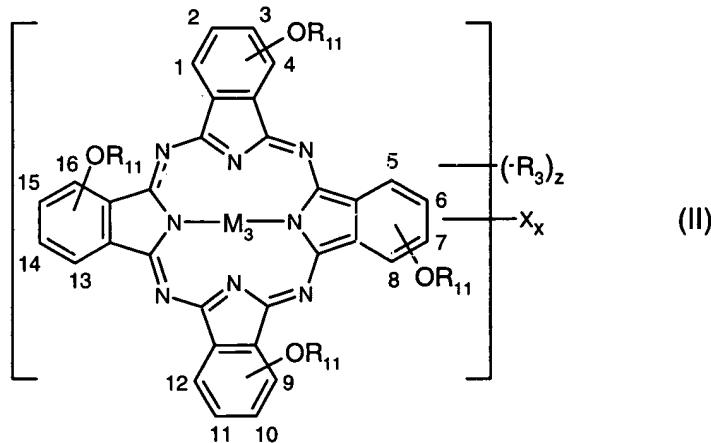
wherein -OR₁₁, R₃ = R₁₄, X and M₃ each have the same meaning in formulae II and IV and are as defined in claim 2, the mol-% amounts making up 100% into said recording layer.

13. (new) A process according to claim 2 wherein the optical recording medium is a DVD, a diffractive-optical element or medium for recording a hologram.

14. (new) A process for the manufacture of optical recording medium having at least one recording layer comprising the steps of

a) incorporating a mixture, which comprises

(a) 60 to 95 mol % of a compound II

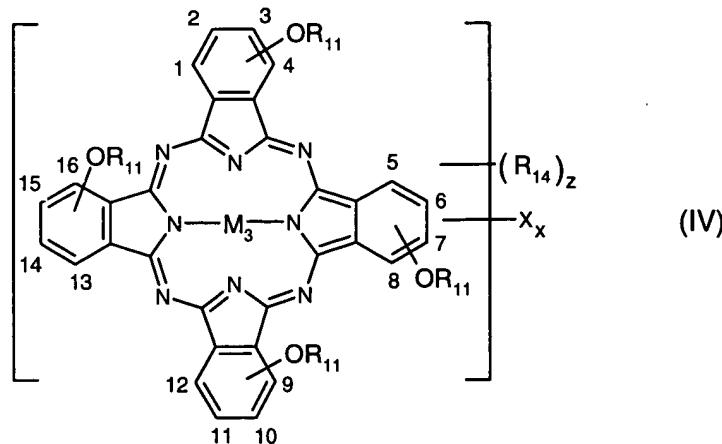


containing one radical R, ($z = 1$),

wherein R₁ is C₁-C₂ alkyl and M₁ is palladium or copper, and z is 1.

(b) 5 to 20 mol % of a compound II containing two R₃ (z = 2), and

(c) 0 to 25 mol % of a compound IV

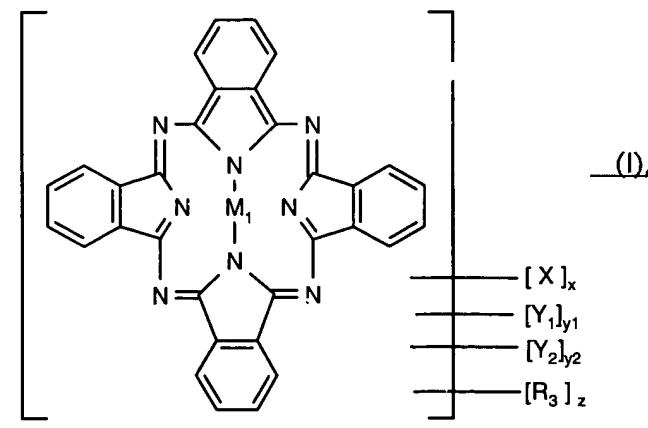


wherein R₁₄ may be -CHO, -CH₂OH, -COOH, -CH₂OC(O)-C₁-C₄alkyl or an acetal, and z may be 1 or 2,

wherein -OR₁₁, R₃ = R₁₄, X and M₃, each have the same meanings in formulae II and IV and are as defined for claim 2, the mol-% amounts making up 100% into said recording layer.

15. (new) A process according to claim 14 wherein the optical recording medium is a DVD, a diffractive-optical element or medium for recording a hologram.

16. (new) An optical recording medium according to claim 9 wherein the metallocenyl-phthalocyanine compound is represented by formula I



wherein

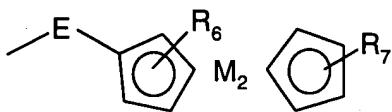
M₁ is a divalent metal, an oxometal group, halogenometal group or hydroxymetal group, or two hydrogen atoms,

X is halogen

Y₁ is -OR₁, -OOC-R₂, -NHR₁, -N(R₁)R₂,

Y₂ is -SR₁,

R₃ is



R₆ and R₇ are each independently of the other hydrogen, halogen, C₁-C₄alkyl, C₁-C₄alkoxy, amino-C₁-C₄alkyl, diarylphosphine, or phosphorus-containing C₁-C₄alkyl,

x may be a rational number from 0 to 8

y₁ and y₂ may be each independently of the other a rational number from 0 to 6

z may be a number from 1 to 4,

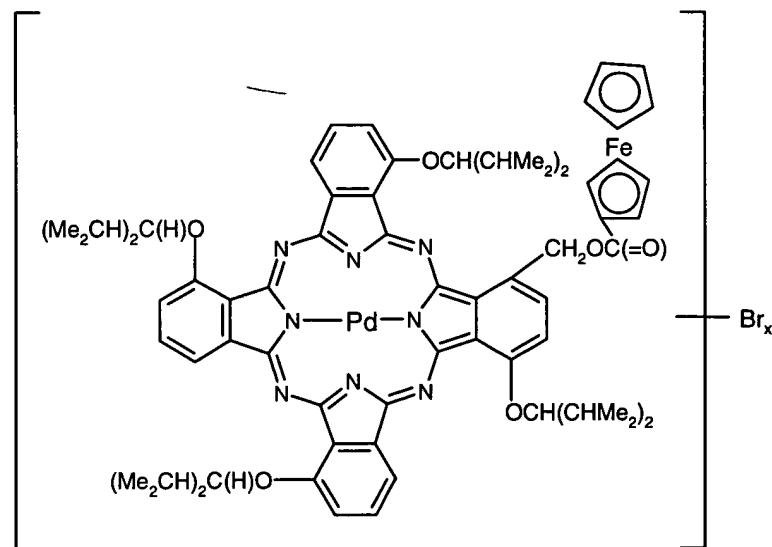
wherein (x + y₁ + y₂ + z) is ≤ 16,

and wherein R₁ and R₂ may be each independently of the other

C₁-C₂₀alkyl which is unsubstituted or substituted by halogen, hydroxy, C₁-C₂₀alkoxy, C₁-C₂₀alkylamino or C₂-C₂₀dialkylamino and which may be interrupted by -O-, -S-, -NH- or -NR₁₀-, wherein R₁₀ may be C₁-C₆alkyl,

C₅-C₂₀cycloalkyl, C₂-C₂₀alkenyl, C₅-C₁₂cycloalkenyl, C₂-C₂₀alkynyl, C₆-C₁₈aryl or C₇-C₁₈aralkyl, and wherein one or two ligands may optionally be bound to the divalent metal atom, the oxometal group, halogenometal group or hydroxymetal group, and E being composed of a chain of at least two members selected from the group consisting of -CH₂-, -C(=O)-, -CH(C₁-C₄alkyl)-, -C(C₁-C₄alkyl)₂-, -NH-, -S-, -O- and -CH=CH-.

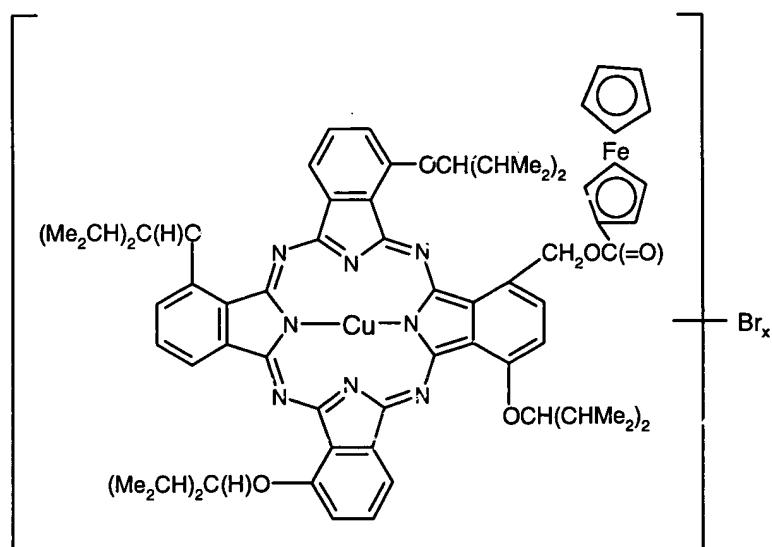
17. (new) An optical recording medium according to claim 9 wherein the metallocenyl-phthalocyanine compound is represented by formula



where $x = 2.6$ to 3.0 , preferably 2.7 to 2.9 , more preferably 2.8

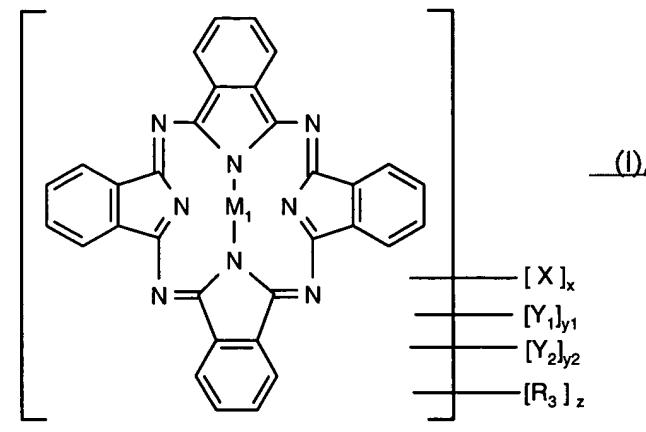
18. (new) An optical recording medium according to claim 17 wherein the optical recording medium is a DVD, a diffractive-optical element or medium for recording a hologram.

19. (new) An optical recording medium according to claim 9 wherein the metallocenyl-phthalocyanine compound is represented by formula



where $x = 0$ to 0.5

20. (new) An optical recording medium according to claim 10 wherein the metallocenyl-phthalocyanine compound is represented by formula I



wherein

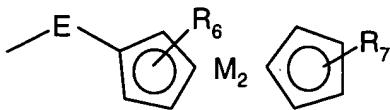
M, is a divalent metal, an oxometal group, halogenometal group or hydroxymetal group, or two hydrogen atoms.

X is halogen

Y is -OR_1 , -OOC-R_2 , -NHR_1 , $\text{-N(R}_1\text{)R}_2$,

Y₂ is -SR_{1,2}

R₃ is



R₆ and R₇ are each independently of the other hydrogen, halogen, C₁-C₄alkyl, C₁-C₄alkoxy, amino-C₁-C₄alkyl, diarylphosphine, or phosphorus-containing C₁-C₄alkyl,

x may be a rational number from 0 to 8

y₁ and y₂ may be each independently of the other a rational number from 0 to 6

z may be a number from 1 to 4,

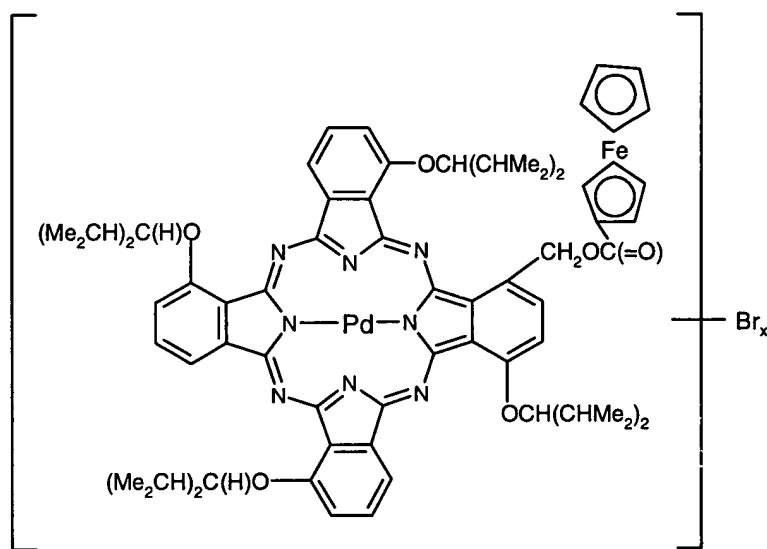
wherein $(x + y_1 + y_2 + z)$ is ≤ 16 ,

and wherein R₁ and R₂ may be each independently of the other

C₁-C₂₀alkyl which is unsubstituted or substituted by halogen, hydroxy, C₁-C₂₀alkoxy, C₁-C₂₀alkylamino or C₂-C₂₀dialkylamino and which may be interrupted by -O-, -S-, -NH- or -NR₁₀-, wherein R₁₀ may be C₁-C₆alkyl,

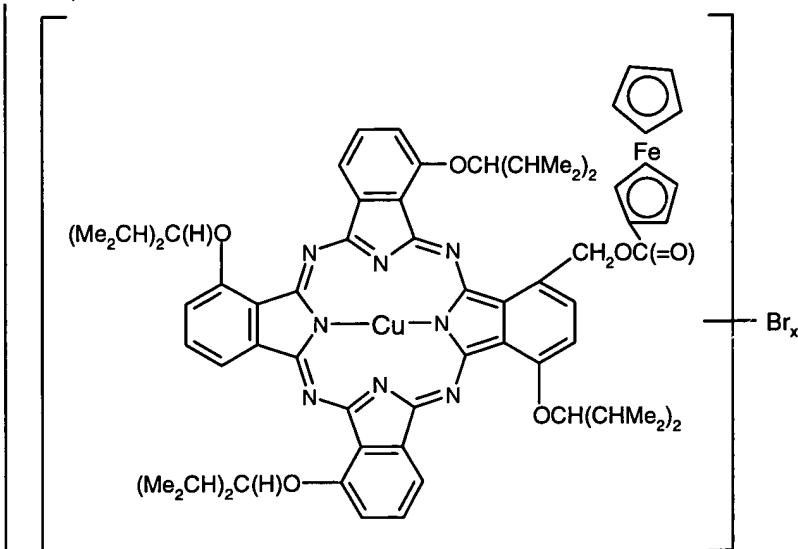
C₅-C₂₀cycloalkyl, C₂-C₂₀alkenyl, C₅-C₁₂cycloalkenyl, C₂-C₂₀alkynyl, C₆-C₁₈aryl or C₇-C₁₈aralkyl, and wherein one or two ligands may optionally be bound to the divalent metal atom, the oxometal group, halogenometal group or hydroxymetal group, and E being composed of a chain of at least two members selected from the group consisting of -CH₂-, -C(=O)-, -CH(C₁-C₄alkyl)-, -C(C₁-C₄alkyl)₂-, -NH-, -S-, -O- and -CH=CH-.

21. (new) An optical recording medium according to claim 10 wherein the metallocenyl-phthalocyanine compound is represented by formula



where x = 2.6 to 3.0, preferably 2.7 to 2.9, more preferably 2.8

22. (new) An optical recording medium according to claim 10 wherein the metallocenyl-phthalocyanine compound is represented by formula



where $x = 0$ to 0.5

23. (new) An optical recording medium according to claim 22 wherein the optical recording medium is a DVD, a diffractive-optical element or medium for recording a hologram.